PCT09

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/890,220

DATE: 02/27/2002
TIME: 13:27:47

Input Set : A:\EP.txt
Output Set: N:\CRF3\02272002\I890220.raw

ENTERED

```
 3 <110> APPLICANT: Dean, Caroline
 4        Gendall, Anthony
 6 <120> TITLE OF INVENTION: Methods and means for modification of plant characteristics
using the
 7        vernalisation gene VRN2.
 9 <130> FILE REFERENCE: Mewburn
11 <140> CURRENT APPLICATION NUMBER: US 09/890,220
12 <141> CURRENT FILING DATE: 2001-07-27
14 <150> PRIOR APPLICATION NUMBER: PCT/GB00/00248
15 <151> PRIOR FILING DATE: 2000-01-28
17 <150> PRIOR APPLICATION NUMBER: GB 9901927.5
18 <151> PRIOR FILING DATE: 1999-01-28
20 <160> NUMBER OF SEQ ID NOS: 77
22 <170> SOFTWARE: PatentIn Ver. 2.1
24 <210> SEQ ID NO: 1
25 <211> LENGTH: 1722
26 <212> TYPE: DNA
27 <213> ORGANISM: Arabidopsis thaliana
29 <400> SEQUENCE: 1
30 caagcttctt caattttgct tgctctctct tacacagcca atcggtgttt tcgcagcttt 60
31 caggcctcaa tccaagacat tctatataag catattgcag aagaggcggt tctaattgtt 120
32 gcattgagtt tatcgctatg acgtagggaa attctaattt aggggaggcc tcagagtttg 180
33 cactaacttc ataatcggct cttgacgttg ttgagtgtaa ttgaacaaga atgtgtaggc 240
34 agaattgtcg cgcgaaatcc tcaccggagg aagtgatttc aactgatgag aatctcttga 300
35 tatattgtaa acctgttcga ctatataaca tctttcacct tcgctctcta ggcaacccat 360
36 cgtttcttcc aagatgcttg aactacaaaa ttggagcaaa gcgcaaaaga aagtcaagat 420
37 ctactgggat ggtagttttc aactataagg attgtaataa cacattacag aaaactgaag 480
38 ttagggagga ttgttcttgt ccattttgct ctatgctatg tggtagcttc aaggggctgc 540
39 aatttcattt gaattcatct catgatttat ttgaatttga gttcaagctt ttcgaagaat 600
40 accagacagt taatgtttct gtaaaactta attccttcat atttgaggaa gaaggaagtg 660
41 atgacgataa atttgagccc ttctctctct gctcgaaacc tcgtaagcgg agacaaagag 720
42 gtggcagaaa taacaccagg agacttaaag tatgcttttt accgttggat tcacccagtt 780
43 taactaatgg cacagaaaat ggaatcaccc tacttaatga tggaaaccgt ggtttaggat 840
44 atcccgaggc aacagagctt gctggacaat ttgagatgac cagcaacatt ccaccagcca 900
45 tagcccactc ttctctggac gctggtgcta aagttatatt gacaagcgaa gctgtggtcc 960
46 ctgctactaa gacaagaaag ttatctgctg agcgatcaga ggctagaagc cacctacttc 1020
47 ttcagaaacg ccaattctat cattctcaca gagtccagcc aatggcgctt gagcaagtaa 1080
48 tgtctgaccg ggatagcgag gatgaagtcg atgacgatgt tgcagatttt gaagatcgcc 1140
49 agatgcttga tgactttgtg gatgtgaata aagatgaaaa gcaattcatg catctttgga 1200
50 actcgtttgt aagaaacaa agggttatag cagatggtca tatctcttgg gcatgtgaag 1260
51 cattttcaag attttacgag aaagagttgc accgttactc atcactcttc tggtgttgga 1320
52 gattgttttt gattaaacta tggaaccatg gacttgtcga ctcagccacc atcaacaact 1380
53 gcaataccat cctcgagaat tgccgtaata gctcagacac caccaccacc aacaacaaca 1440
54 acagtgtgga tcgtcccagt gactcaaaca ccaacaacaa taacattgtg gatcatccca 1500
```

RAW SEQUENCE LISTING   DATE: 02/27/2002
PATENT APPLICATION: US/09/890,220   TIME: 13:27:47

Input Set : **A:\EP.txt**
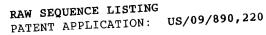Output Set: **N:\CRF3\02272002\I890220.raw**

```
55 atgacataaa caacaagaac aatgttgaca acaaggacaa taacagcaga gacaaagtaa 1560
56 ttaaatagga aaatctccgg cttttatgat accgatttat cggattgtaa cttattcttc 1620
57 tttcttaaaa aattgtttag gagcaaacaa attttttata tgttagtgta ttcaactgat 1680
58 tacatttta gttaaaaaaa aaaatggatt ctgcttataa ct                    1722
61 <210> SEQ ID NO: 2
62 <211> LENGTH: 445
63 <212> TYPE: PRT
64 <213> ORGANISM: Arabidopsis thaliana
66 <400> SEQUENCE: 2
67 Met Cys Arg Gln Asn Cys Arg Ala Lys Ser Ser Pro Glu Glu Val Ile
68   1               5                  10                  15
70 Ser Thr Asp Glu Asn Leu Leu Ile Tyr Cys Lys Pro Val Arg Leu Tyr
71             20                  25                  30
73 Asn Ile Phe His Leu Arg Ser Leu Gly Asn Pro Ser Phe Leu Pro Arg
74         35                  40                  45
76 Cys Leu Asn Tyr Lys Ile Gly Ala Lys Arg Lys Arg Lys Ser Arg Ser
77     50                  55                  60
79 Thr Gly Met Val Val Phe Asn Tyr Lys Asp Cys Asn Asn Thr Leu Gln
80  65                  70                  75                  80
82 Lys Thr Glu Val Arg Glu Asp Cys Ser Cys Pro Phe Cys Ser Met Leu
83             85                  90                  95
85 Cys Gly Ser Phe Lys Gly Leu Gln Phe His Leu Asn Ser Ser His Asp
86             100                 105                 110
88 Leu Phe Glu Phe Glu Phe Lys Leu Phe Glu Glu Tyr Gln Thr Val Asn
89         115                 120                 125
91 Val Ser Val Lys Leu Asn Ser Phe Ile Phe Glu Glu Glu Gly Ser Asp
92     130                 135                 140
94 Asp Asp Lys Phe Glu Pro Phe Ser Leu Cys Ser Lys Pro Arg Lys Arg
95 145                 150                 155                 160
97 Arg Gln Arg Gly Gly Arg Asn Asn Thr Arg Arg Leu Lys Val Cys Phe
98                 165                 170                 175
100 Leu Pro Leu Asp Ser Pro Ser Leu Thr Asn Gly Thr Glu Asn Gly Ile
101             180                 185                 190
103 Thr Leu Leu Asn Asp Gly Asn Arg Gly Leu Gly Tyr Pro Glu Ala Thr
104         195                 200                 205
106 Glu Leu Ala Gly Gln Phe Glu Met Thr Ser Asn Ile Pro Pro Ala Ile
107     210                 215                 220
109 Ala His Ser Ser Leu Asp Ala Gly Ala Lys Val Ile Leu Thr Ser Glu
110 225                 230                 235                 240
112 Ala Val Val Pro Ala Thr Lys Thr Arg Lys Leu Ser Ala Glu Arg Ser
113             245                 250                 255
115 Glu Ala Arg Ser His Leu Leu Leu Gln Lys Arg Gln Phe Tyr His Ser
116         260                 265                 270
118 His Arg Val Gln Pro Met Ala Leu Glu Gln Val Met Ser Asp Arg Asp
119         275                 280                 285
121 Ser Glu Asp Glu Val Asp Asp Asp Val Ala Asp Phe Glu Asp Arg Gln
122     290                 295                 300
124 Met Leu Asp Asp Phe Val Asp Val Asn Lys Asp Glu Lys Gln Phe Met
125 305                 310                 315                 320
```

```
127 His Leu Trp Asn Ser Phe Val Arg Lys Gln Arg Val Ile Ala Asp Gly
128                 325                 330                 335
130 His Ile Ser Trp Ala Cys Glu Ala Phe Ser Arg Phe Tyr Glu Lys Glu
131             340                 345                 350
133 Leu His Arg Tyr Ser Ser Leu Phe Trp Cys Trp Arg Leu Phe Leu Ile
134         355                 360                 365
136 Lys Leu Trp Asn His Gly Leu Val Asp Ser Ala Thr Ile Asn Asn Cys
137     370                 375                 380
139 Asn Thr Ile Leu Glu Asn Cys Arg Asn Ser Ser Asp Thr Thr Thr Thr
140 385                 390                 395                 400
142 Asn Asn Asn Asn Ser Val Asp Arg Pro Ser Asp Ser Asn Thr Asn Asn
143             405                 410                 415
145 Asn Asn Ile Val Asp His Pro Asn Asp Ile Asn Asn Lys Asn Asn Val
146             420                 425                 430
148 Asp Asn Lys Asp Asn Asn Ser Arg Asp Lys Val Ile Lys
149         435                 440                 445
153 <210> SEQ ID NO: 3
154 <211> LENGTH: 6338
155 <212> TYPE: DNA
156 <213> ORGANISM: Arabidopsis thaliana
158 <400> SEQUENCE: 3
159 aaagagaatg ctttgactct ctcattggtc aaacctgact gtatttatat gcgttattgt 60
160 gtggtaaagt ttcgaccttt gactttacaa gttggcgtta agaagagaga tgcgtagatc 120
161 agcgagtggt tcgagagttt tggatcattt tcccccgact tcacggtctc cacgtcgatc 180
162 tcagagcatt acatcattgg aagatgatgt ggaggtgctt ttgcctaggt acgatccgaa 240
163 ttctcaagcg gggaagagag agaagtcaag attcagattt gcagaaaacg tcatccattt 300
164 gattcctctc attcttcttc tctgtatcgc aatcctctgg ctctcctctt attcaggtaa 360
165 gccgagaaat tgattcaatc tctatgaatc cataattgat atgtgaaact taattaggga 420
166 ttttacaaag gctcatatgg atatgatatg aggatcgaga tgtctctgta acattagaat 480
167 cttgtgttga attattgttt caatttgttc atattatact aaaccggtga tggatttgga 540
168 atttgtcagc agcgttaagg agttgagttc aagaagcaac atgttgtctt gtctccatgg 600
169 gaactcatca tattcagttt tgggaaagga aacaattttt tttaccgccg gtgattatgt 660
170 gccgcaaacc atacgtaact tttgtaattt tcggttctgt agacacataa aaggatctct 720
171 cgttttcatg aaatgtatgt ttaatatttc actatacatc acacaactca agtagaaaac 780
172 actgatggtt atccattaat catcattcta ttggtcgaaa acaaggatta gtttcaactt 840
173 attgctacct tagtgattag atgttcctgt gagtttcagc tagccaagtc aactagagtt 900
174 aaacaatgga atcaaaatac atattcagta atttatttta aactctgact atttatgtaa 960
175 acaaaaatgg aaattaaaat tgaaggtcat gaagattcta ttcttagtat gaaaagtata 1020
176 gatcaatgat aaaagtatat accagaacag tggtggatct agaaacatat ttagtatatg 1080
177 gcacaatata tttaacatat acaaatttta atctaaaagt tgtattcatt tatgaaaaga 1140
178 cwtctgaatg aagcaaattt atttgatgtg ttaatcatcc atttatgtgt taatcagcca 1200
179 ttgatgttag tatagtactc tatgctaaca taattttttt atactataaa ttaaaaaaat 1260
180 aggtaagaaa agaaaaatag attaatataa aaagcatttt attagctgaa ataaataaaa 1320
181 tgaaagaaga taataactaa ttgactaaaa aattagtaga gcatatgggg cacaatacac 1380
182 taagtatttc atctttacta taaaatgtaa caaatttcaa aattatcaaa ctgtatatag 1440
183 ggcacgtgcc taggtaccaa tagacgtacg tccgccctga ataagttggt gaatatggt 1500
184 tttaattcct ctaatactca ctgtactgcc atggtagagg tgaaaaaaac aattttagaa 1560
185 atattataat ggattaagct gtccaagttg gtcgtatttt ctttacattt tattaactaa 1620
186 taaacataaa taagttcaac tatttattga ctagtaataa tacgtgtaaa atgtctattg 1680
```

```
187 gtttaaaata tgggccataa ggcccagact tgaaaaaaaa acttgaaacc caaagttata 1740
188 tttttacttg tttcttcttt ctcagtgaat atctcccaat caagcttctt cgattttgct 1800
189 ctctcttaca cagccaatcg gtgttttcgc agctttcagg tttgtctcaa tctcaaatta 1860
190 aatcggagtc aagtaataac aattgataaa cctaattgtt tccattgtat tgtaagattt 1920
191 gaaattttgc tgtagatccg gaatcgaatt ctagttctgg aatcgttgat ctcgatggaa 1980
192 tttttttttt aagatttctt cttacacatt tggttcaaaa gatcacatag ttttatttta 2040
193 atttgataag tatgatgatt ctgctaagtg gcattggata aagttttcgt ttttgcaata 2100
194 cgtctaaact tgtctatgtc ttgaatgaac tctctgagtt gcttaaaaag tcttgtgctt 2160
195 tctttattac acaggcctca atccaagaca ttctatataa gcatattgca gaagaggcgg 2220
196 ttctaattgt tgcattgagt ttatcgctat gacgtaggga aattctaatt taggggaggc 2280
197 ctcagagttt gcactaactt cataatcggc tcttgacgtt gttgagtgta attgaacaag 2340
198 aatgtgtagg cagaattgtc gcgcgaaatc ctcaccggag gaagtgattt caactgatga 2400
199 gaatctcttg atatattgta aacctgttcg actatataac atctttcacc ttcgctctct 2460
200 aggcaacgta tgatttgcct tcctctctca tcatattagc tcagtaatct ttcatctcct 2520
201 gtgtagatca cccactaata gtttgagttt gctaagctga ttatggtctg attcatggcg 2580
202 agtgtgtgct tcttttgtct cctaaatttg aacttgttgt ttgttgttgc agccatcgtt 2640
203 tcttccaaga tgcttgaact acaaaattgg agcaaagcgc aaaagaaagt atgttttctt 2700
204 cttgaatgta gctgctacag tgatatgtta tttatcttac ttctaatatg gaagctgatg 2760
205 acctatttta tctttgttga gtagatatgg acataatgaa tggtttcttc tttgttcatg 2820
206 ctataaactt acattttata aaattgtgtt ttggttaggt caagatctac tgggatggta 2880
207 gttttcaact ataaggattg taataacaca ttacagaaaa ctgaaggtta gtctttttct 2940
208 gttcgtcgac aaaattcgat gtcaatgtct atgtttctct agatgatttg ttatttacta 3000
209 ttttttttctg tattgtcatg cagttaggga ggattgttct tgtccatttt gctctatgct 3060
210 atgtggtagc ttcaaggtgg gcaactatta caactgaggt ttcttccggg gcctttcata 3120
211 tctaacactg tgaaatgcta ctgctgtttc atgctgtata ctttcactgt ttggttacat 3180
212 attttgtgt ttgttgtttg tcttctcact cttttcgaac tgctgagtgt gtgcttatct 3240
213 gagaaaacat gtcccagatg gagcttacaa ccaattgtct tgtgtctatg caggggctgc 3300
214 aatttcattt gaattcatct catgatttat ttgaatttga gttcaaggta tgtggtttta 3360
215 tggaaattct tgatttgcta tgcctttatt aatgaggtta tagttaaaaa agggtctttc 3420
216 ctattgtagc tttcggaaga ataccagaca gttaatgttt ctgtaaaact taattccttc 3480
217 atatttgagg tcagttactt taaacttggt taattgggaa atccgatagc tggtgaaaat 3540
218 tttgtttata ttccatcctt atttgtacta ggaagaagga agtgatgacg ataaatttga 3600
219 gcccttctct ctctggtaac cctcagaacc ccttcgatta aataccttaa tagcagtaac 3660
220 tccttgcttc tcttgtcagt acatctctgt aaatccaacc ataatgtttt gcagctcgaa 3720
221 acctcgtaag cggagacaaa gaggtggcag aaataacacc aggagactta aagtatgctt 3780
222 tttaccgttg gattcaccca gtttaactaa tggcacagaa aatggaatca ccctacttaa 3840
223 tgatggtaaa atcatatctt cttctgtgcg ttccttgtgg cttagaactt catattacag 3900
224 aagaagatac aatggcctga ttgtttagtt tttgtacttc tcctcgcatt cttcttgcga 3960
225 gggtattgtt accagaactg atgtacaaaa ttaatggcat gctacaggaa accgtggttt 4020
226 aggatatccc gaggcaacag arcttgctgg acaatttgag atgaccagca acattccacc 4080
227 agccatagcc cactcttctc tggacgctgg tgctaaagtt atattgacaa gcgaagctgt 4140
228 ggtccctgct actaagacaa gaaagttatc tgctgagcga tcagaggcta gaaggtttgt 4200
229 tcatcatgac accccgtcat cataattacc attcctgttg ttacaaatgt tcttcctatt 4260
230 atggataagt gtttatagta ctgccatatt aaccgagaaa atttcttcca gccacctact 4320
231 tcttcagaaa cgccaattct atcattctca cagagtccag gtgatccaag ttccttcacc 4380
232 tacttcttag gcatttttctt taaattgctc atgatgatat cttatcaaag catacttggt 4440
233 ttgttctcat ccaaatttgt attttgatct gtatgtatca acgcaaaata gttatgtcca 4500
234 tgttgtctcc gtttttattgc cactaaccaa aaaatgcatg tttctgtgac aagccaatgg 4560
235 cgcttgagca agtaatgtct gaccgggata gcgaggatga agtcgatgac gatgttgcag 4620
```

L:1455 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:50

```
236 attttgaaga tcgccaggta ttccatgatt tctttctgcg ttcattaaat agacaacaga 4680
237 aaatggtata tgatgtaact tgctaatggc ttttgaaact taaaaaagct gcagatgctt 4740
238 gatgactttg tggatgtgaa taaagatgaa aagcaattca tgcatctttg gaactcgttt 4800
239 gtaagaaaac aaaggtaact acttctctta cacatgaaca gacacaaaaa gaccttatgt 4860
240 cttacattcc atacctgtct aaatgatttt gcttatggaa ctttgagctc aattatgatt 4920
241 gttgatgttt cagggttata gcagatggtc atatttcttg ggcatgtgaa gcattttcaa 4980
242 gattttacga gaaagagttg caccgttact catcactctt ctggtaatat aagtacacca 5040
243 aacatataca gacacataac tacactatca atcttgtttc gttttctgaa aaaaaaataa 5100
244 aaatttccag gtgttggaga ttgtttttga ttaaactatg gaaccatgga cttgtcgact 5160
245 cagccaccat caacaactgc aataccatcc tcgagaattg ccgtaatagc tcagacacca 5220
246 ccaccaccaa caacaacaac agtgtggatc gtcccagtga ctcaaacacc aacaacaata 5280
247 acattgtggr tcatcccaat gacataaaca acaagaacaa tgttgacaac aaggacaata 5340
248 acagcagaga caaagtaatt aaataggaaa atctccggct tttatgatac cgatttatcg 5400
249 gattgtaact tattcttctt tcttaaaaaa ttgtttagga gcaaacaaat tttttatatg 5460
250 ttagtgtatt caactgatta cattttttagt taaaaaaaaa aatggattct gcttataact 5520
251 aaaaactgaa aaaaagaaa agtttcctta attttttcttt ttgacttgag aaaaagctcc 5580
252 tctagtaaat atgagttata tattaatcaa gtacataaca taaaaatagt atatattaag 5640
253 tgcaaataga ttgaaaacaa atcaagaaga aattaattaa gacagagtga ttaagcttaa 5700
254 aaccccattt ggacttgttc tttctcaatg aatccctcac aagcagcaag cttcttcgat 5760
255 tttgctttga caccaccaat cggtgttttc gaatctttca ggtttgtctc gatttcaatc 5820
256 tagatcggag tcaagtaata aaattgatta acctaagtat tcccgttctc tcgtaagagt 5880
257 tgggatttag cagtagatcg gaaatcggaa tttacgtttt tgttaaaaga ttgatggttt 5940
258 aggtaatgga acatagttct ggattcattg cttctagttg attctcgaat tgtttgattt 6000
259 cgcaatgcac atttttgttt caaaggatca cagaatttga tttaaaattt gacaaaattc 6060
260 catcaatttc tcatattagg gtttatattt cttctagtaa ctcgaacttg ttggaactct 6120
261 gtatactctg tgctatgtag ataaagtctt aacattttgg tcaactttgt ttgatctcta 6180
262 aactagtttg ggctctctgt tttaaagttt tgtgctttca ctattacaca ggtctcatac 6240
263 aagactacag tctcaagaag cataatatcg tcgactctgt tttgagtttc tcaacagtgg 6300
264 ttgaagctta aggaggttct tatgtgcgtt ttgatatc                          6338
267 <210> SEQ ID NO: 4
268 <211> LENGTH: 1715
269 <212> TYPE: DNA
270 <213> ORGANISM: Arabidopsis thaliana
272 <400> SEQUENCE: 4
273 caagcttctt caattttgct tgctctctct cttacacggc caatcggtgt tttcgcagct 60
274 ttcaggcctc aatacaagac attctatata agcatattgc agaagaggcg gttctaattg 120
275 ttgcatggag ttgaacaata tgacgtaggg aaattctaat ttaggggagg cctcagagtt 180
276 tgcactaact tcataatcag ctctggacgt tgttgattgt atttgaacaa gaatgtgtag 240
277 gcagaattgt cgcgcgaaat cctcaccgga ggaagtgatt tcaactgatg agaatctctt 300
278 gatatattgt aaacctgttc gactatataa catctttcac cttcgctctc taggcaaccc 360
279 atcgtttctg ccaagatgct tgaactacaa aattggggca aagcgcaaaa gaaagtcaag 420
280 atctactggg atggtagttt tcaactataa ggattgtaat aatacattac aaagaactga 480
281 agttagggag gattgttctt gtccatttttg ctctatgcta tgtggtagct tcaaggggct 540
282 gcaatttcat ttgaattcat ctcatgattt atttgaattt gagttcaagc ttttggaaga 600
283 ataccagaca gttaatgttt ctgtaaaact taattccttc atatttgagg aagaaggaag 660
284 tgatgatgat aaatttgagc ccttctctct ctgctcgaaa cctcgtaagc gtagacaaag 720
285 aggtggcaga aataacacca ggagacttaa agtatgcttt ttaccgttgg attcacccag 780
286 tttagctaat ggcacagaaa atggaattgc cctgctgaat gatggaaacc gtggtttagg 840
287 atatcccgag gcaacagagc ttgctggaca atttgagatg actagcaaca ttccaccagc 900
```